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DO ENVIRONMENTAL COSTS IMPACT FINANCIAL SUSTAINABILITY? AN EMERGING MARKET'S PERSPECTIVE.

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Abstract:

The importance of adequately managing environmental costs must be considered. This paper investigated the relationship between environmental costs and the financial performance of 45 cement and mining listed on the Johannesburg Stock Exchange from 2014 to 2021. Financial performance is measured by return on equity, while environmental cost is proxied by carbon management, recycling, and pollution prevention costs. Control variables such as growth, leverage, size, and debt ratio are used in this study. The study applied a quantitative research approach using an ex-post facto research design. The researchers adopted a panel regression analysis. The result of the study indicates a negative and significant association between environmental costs and return on equity. It was concluded that environmental costs reduce profitability in the form of the return on equity of the sampled companies. This study has practical implications for motivating corporate managers to proactively manage environmental costs to improve corporate financial performance. Additionally, it helps to shape environmental policies that intend to augment ecological performance practically.

Keywords: Environmental Costs, Financial Sustainability, Return on Equity, Pollution Prevention Costs, Johannesburg Stock Exchange

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INTRODUCTION

Environmental challenges have become a global thorn. This forces companies to consider environmental issues in their operations and to pay more attention to environmental management. As a result, environmental sustainability has of late been considered a key subject in business operations to address stakeholders' expectations. The increasing environmental campaigns and awareness by the government and other stakeholders have forced organizations to consider ecological management a key component of their business operations and be environmentally friendly (Sales, 2019).

The interaction with the environment is not without costs and implications (Ikpor et al., 2019). According to Nyirenda et al. (2013), companies' production processes have created environmental degradation from emissions emitted or pollution and wastes. Ferdous et al. (2019) concluded that this has also generated negative environmental impacts, such as depletion of the ozone layer leading to climate change, resource depletion, and scarcity. To control these environmental impacts, companies incur costs to reduce and prevent the negative environmental impacts imposed on the public. In other words, these are costs incurred due to emissions and waste (Jasch, 2000; Christ et al., 2016). Such costs were termed environmental costs.



Environmental costs are often hidden in overhead costs and thus are not accurately known. The environmental management accounting system was developed to reveal direct costs initially summed up in overhead expenses to overcome challenges (IFAC, 2005; Gunarathne & Lee, 2015).

IFAC (2005) defines environmental costs as costs incurred in protecting the environment. In addition, Jasch (2003) argues that environmental costs “are not a separate type of cost altogether.” While, according to United Nations (2001) and Ariffin (2016) as environmental costs rise and become integrated into day-to-day decision-making, the value of environmental management accounting will increase. However, companies' financial performance will depend not only on their services or products but also on their response to the environment in which it operates (Gunarathne & Lee, 2015). The implication is that environmental matters now influence the profitability of organizations (Kelsall, 2020; Bracci & Maran, 2013). Therefore, an absence of a connection between an organization and environmental sustainability limits its profit maximization. Recent empirical and analytical research reflects that there is a direct association between environmental performance and corporate profitability (Le et al., 2019). In that regard, organizations are expected to monitor their environmental performance and environmental costs. It is also because the United States Environmental Protection Agency (USEPA) (1997) and Johnstone (2018) mention that environmental costs can be materially minimized due to business decisions. Therefore, effective management of environmental costs can lead to improved ‘environmental performance and significant benefits to human health as well as business success’ (USEPA, 1997).

Based on the discussion above, there is a connection between environmental performance and environmental costs on financial performance. Based on this, research of listed manufacturing companies on the Johannesburg Stock Exchange (JSE) is necessary because these companies generate huge environmental impacts (WWF, 2018). The listed manufacturing companies in South Africa have also witnessed a massive contradiction between economic growth and environmental degradation in the form of pollution and resource depletion (WWF, 2018).

This study will contribute significantly by empirically showing that making environmental costs more visible assists managers focus on essential areas of environmental issues. Furthermore, in the contemporary literature on environmental accounting, the field evidence backing the link between environmental cost and financial performance needs to be more consistent and mixed (Nuzula, 2019; Naimo, 2020). Our research contributes to this constituency of literature that still needs to be more conclusive. External costs emerge from the internal and external operations of the company and are all costs expensed concerning environmental protection (IFAC, 2005). Deegan (2003) notes that most of these costs are usually not traced systematically and attributed to the responsible processes and products but summed up in general overheads. In addition, Yan (2014) contends that there needs to be consistency in how environmental costs are defined from time to time to facilitate inter-period comparisons.

Acti et al. (2013) analyzed the effect of environmental costs on the corporate performance of oil companies in Nigeria and discovered a positive association between the two variables. Onyinyichi et al. (2017), using multiple regression analysis, examined the impact of environmental costs on the organizational performance of Nigerian Brewery companies using data for the 2011-2015 period. Donation and medical expenses were reported to have a negative association ($r = -0.068$ and $r = -0.072$) with return on assets (ROA), while training expenses had a positive relationship with ROA. Also, using a multiple regression analysis on fifteen Indonesian mining and manufacturing companies listed on the Indonesian Stock Exchange from 2014 to 2018, the researchers estimated the effect of environmental costs on financial performance. The



findings reveal that environmental costs positively influence the financial performance of mining and manufacturing companies, with a significant level of 0.047. The authors stressed that lessening environmental costs is associated with positive company performance. Numerous studies have been carried out to determine the effect of environmental costs on financial performance, all establishing that further research is critical (Nwaimo, 2020; Onyinyichi et al., 2017; Lee, 2015).

Falack et al. (2020) studied the influence of environmental costs on the organizational performance of 12 listed oil and gas companies in Nigeria. They observed that environmental protection, development, and safety cost has a negative but significant relationship with ROA. Furthermore, environmental protection, development, and safety costs showed a negative and insignificant relation with EPS. To support this, Ikpor et al. (2019), in their findings, report that environmental prevention costs have a significant and negative effect on the ROA of petroleum firms in Nigeria. Nuzula (2019), using 27 chemical companies on Japan Exchange Group during the 2013-2015 period put, that environmental costs negatively affect ROA; environmental costs do not affect the return on earning (ROE); environmental costs are negatively affecting net profit margin, and environmental cost does not affect the price to earnings ratio (PER).

In South Africa, Nyirenda et al. (2013) sampled mining firms to research environmental management practices and company performance utilizing shareholder's return on equity (ROE) as a proxy. The findings cast an absence of significant association between the two variables. The result of the study revealed a need for a significant relationship between the dependent and independent variables. This study contradicts with findings of prior studies by Cortez and Penacerrada (2010), Cortez and Cudia (2010), Chiang et al. (2015), Acti et al. (2013), and Onyinyichi et al. (2017). However, Nuzula (2019) suggests that the contradiction of findings could be emanating from different sectors and proxies used for measuring financial performance. For instance, Cortez and Penacerrada (2010), Cortez and Cudia (2010), and Chiang et al. (2015) executed their research on the automobile in Japan, while Acti et al. (2013) and Onyinyichi et al. (2017) used oil companies and brewery firms in Nigeria respectively.

Also, Naimo (2020), using waste management, community development, and employee health and safety as an environmental cost in Sub-Saharan companies, established that environmental costs have no significant effects on the performances of quoted firms in regional Sub-Saharan. Using data from 2006-2017, Naimo (2020) notes a need for environmental cost capturing and reporting in the region. Similar studies (Oberholzer & Prinsloo, 2011; Adediran & Alade, 2013; Okoye & Adeyini, 2017) have reported that environmental costs have no significant impact on firm performance.

Thus, from the above discussion, previous literature has generated mixed and varying findings on the relationship between environmental costs and financial performance. It calls for further research to establish and validate the findings. Scholars need to be more united in their views on this relationship between environmental costs and financial performance. Based on this view, the following hypotheses are developed:

1. H1: Carbon management costs have no significant effect on the EPS of listed South African mining companies.
2. H2: Pollution control costs have no significant effect on ROA of listed South African mining companies.
3. H3: Environmental protection costs have no significant effect on ROE of listed South African mining companies.

METHODS

The study used the ex-post facto research design because of the evaluation of present information over a long period. This research method comprises a preliminary analysis of the companies' yearly reports to quantify the environmental costs in various forms. Data for this paper was secondary data produced from annual integrated reports and annual financial statements of 45 mining and cement companies listed on the Johannesburg Stock Exchange from 2014 to 2021. The study's population borders on 42 mining companies listed on the Johannesburg Stock Exchange as of 31 December 2021. The study used eight years of annual integrated reports and annual financial statements of these companies from 2014 to 2021.

RESULT AND DISCUSSION

Table 1. Descriptive Statistics

Variable	Min	Max	Mean	S.D
Return on equity	1.112	2.181	1.998	.0776
Carbon management costs	21.99	67.98	33.45	31.87
Recycling costs	32.88	99.12	54.89	47.09
Pollution prevention expenditure	18.77	41.09	31.99	26.09
Debt ratio	2.011	7.911	4.223	1.911
Leverage	1.887	3.991	2.101	.0871
Size	3.665	11.98	5.087	2.091
Growth	8.091	21.98	14.78	3.098

Source: Author, 2023

Table 1 depicts the average value for each variable, minimum and maximum values, and standard deviation. Therefore, Table 1 explains the nature of the chosen South African cement and mining companies sampled in this research. In conclusion, it was noticed that the sampled mining and cement companies from 2014 to 2021 were symbolized by excellent corporate financial performance (return on equity = 1.998).

Table 2. Coefficients of Dependent Variable: Return on Equity

Model	Unstandardized Coefficients		Std. Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.309	.221		-2.887	.001		
CARB	-.009	.163	.1737	2.693	.005	.695	1.438
RECY	-.981	.043	.152	-.064	.002	.534	1.872
POLL	-.084	.879	.916	.423	.005	.898	1.113
DEBTR	.091	.834	.374	-.234	.004	.567	1.765
LEV	.042	.997	.775	-.876	.089	.646	1.548
SIZE	-.211	3.590	-.838	4.186	.766	.865	1.156
GROW	.049	.321	.103	.023	.042	.549	1.821

Source: Processed by Author, 2023

The parameters in return on equity model were evaluated. Table 2 indicates the coefficients table results from the SPSS. It also indicates the coefficient from the t-test using a significance



value of $p = .05$. The coefficient table explains the degree to which "the individual predictor variable contributes to the model" (Nuzula, 2019).

There is strong evidence that the ROE model has explanatory power ($p = .001$). Table 2 depicts that CARB ($p = .005$), RECY ($p = .002$), and POLL ($p = .005$) were negatively significant in their capacity to predict ROE; H1, H2, and H3 are accepted and supported. It is, therefore, accepted that there is a statistically significant association between environmental costs and financial performance measured by ROE.

The control variables in Table 2 shows mixed reaction to the relationship between environmental costs and financial performance measured by ROE. DEBTR (Debt ratio) ($p = .041$) and GROW (Growth) ($p = .023$) were positively and significantly effective in estimating ROE. It means that an increase in debt ratio and growth (year-on-year percentage change in sales) ultimately increases ROE and environmental costs (CARB, POLL, and RECY).

Nonetheless, an investigation of the collinearity is done to certify the generalizability of the findings. Collinearity statistics in Table 2 disclosed that the highest variance inflation factor was 1.872, and the smallest tolerance value was .534, which lies within the expected thresholds. Tolerance quantifies the impact of "one independent variable on all other independent variables" (Al-Mawali, 2021). A tolerance of less than 0.1 suggests the availability of multicollinearity in the data (Hair et al., 2014). Also, VIF bigger than 10 provide evidence of multicollinearity in the data (Ringle et al., 2015). It means that data applied to test the return on equity lacked multicollinearity.

The study's findings reflect that environmental costs negatively and significantly impact financial performance proxied by return on assets. It means that an increase in environmental costs correspondingly reduces profitability. It suggests that managers are now more critical in effectively managing environmental costs. Therefore, companies likely to invest in initiatives to lessen environmental costs are expected to enjoy higher profitability. It is owing to the postulation that it is now more vital than ever to outperform in environmental sustainability. The findings provide a source of motivation for managers to take environmental initiatives seriously to benefit from improved financial performance. For example, a study by Chiang et al. (2015) acknowledges that enhanced financial performance culminates in increased financial performance.

Additionally, recent research by Ikpore et al. (2019) demonstrates that if not appropriately managed, environmental costs cause a reduction in profitability. Similarly, Koye and Adeniyi (2017) concede that environmental costs lessen profitability through improper pricing. It is because environmental costs need to be adequately allocated to their products. Instead, they are allocated to all products in the production line, making them expensive compared to competitors.

The negative relationship between environmental costs and ROE signifies that managers need to take proactive action to manage and reduce environmental costs. Accounting systems such as carbon accounting systems can assist companies in managing and reducing carbon emissions. It is because investors value companies that use modern technology and approaches to reducing environmental impacts (Nwaimo, 2020). In addition, properly managing environmental costs empowers a firm to achieve operational efficiency, leading to cost savings and increased competitive advantage (Adediran et al., 2013). Furthermore, improved environmental cost management augments the business's legitimacy in the community's view, which may increase its corporate image (Acti et al., 2013). Preferably, companies with a positive image are more likely to observe an upsurge in the value of their shares, hence, positive profitability.

CONCLUSION

This research investigated the association between environmental costs and the financial performance of 45 cement and mining companies listed on JSE. Broadly, the researcher intended to identify whether environmental costs such as carbon management, recycling, and pollution prevention costs influence financial performance proxied by return on assets. The hypotheses were empirically tested by applying the panel regression model. It was concluded that the accounting-based return on equity measure is negatively and significantly related to environmental costs. It means that increasing the environmental costs reduces the profitability of the sampled companies.

Given that, the study makes several recommendations grounded on the companies' present state of environmental costs. For example, stringent environmental legislation is long overdue for companies to adopt environmental accounting systems to mitigate environmental costs' effect on corporate performance and sustainability. It can ignite innovation among the companies, leading them to achieve environmental and financial sustainability concurrently. For companies to capitalize on environmental protection, this paper's researchers suggest that companies should invest beyond just compliance and search for diverse, innovative combinations which can incentivize or compensate their investments favorably. Another fundamental issue is that environmental costs management should not be viewed as a once-off event but should have to be taken as a continuous process that needs companies to relegate themselves as learning organizations in terms of environmental costs. This research laid bare new empirical evidence that, if not adequately managed, environmental costs can be a headache to profitability from an emerging market perspective. The practical repercussion of this research is that it can help corporate managers of JSE-listed companies in South Africa to proactively apply various strategies and approaches to manage environmental costs to decrease their financial consequences on financial performance.

However, the study focused on only one financial performance measure. Therefore, the study only analyzed the effect of environmental costs on return on equity. The limitation of this study can be overcome by future studies considering other accounting-based measures such as return on assets and market-based measures such as Tobin q. Furthermore, other future studies can assess the influence of slack resources on environmental cost management among companies listed on JSE in sectors such as agriculture and universities.

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